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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/717,088      | 11/19/2003  | Ke Liu               | C-3289HyS           | 7020             |

7590

12/15/2005

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| EXAMINER |
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CAMPBELL, KELLY E

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| ART UNIT | PAPER NUMBER |
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3618

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/717,088

Applicant(s)

LIU ET AL.

Examiner

Kelly E. Campbell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☒ Claim(s) 1-4 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

This application is in condition for allowance except for the following formal matters:

### *Claim Objections*

Claim 1 is objected to because of the following informalities:

Claim 1, line 2, the phrase

**Oxides-of-nitrogen ("Nox", hereinafter) trap assembly** - is inappropriate and should be modified to :

**An Oxides-of-nitrogen (Nox) trap assembly**

Claim 1, line 4, the phrase

**A mixture of hydrogen and carbon monoxide ("syngas", hereinafter)** - is inappropriate and should be modified to :

**A mixture of hydrogen and carbon monoxide (syngas)**

The claims are replete with punctuation errors , an example of which is:

Claim 1, line 15,

...receiving at its input syngas, and providing at a main out thereof syngas for use in...

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should be corrected to:

receiving at its input syngas, and providing at a main out thereof syngas for use  
in...

Applicant should submit a formal set of claims, since the applicant's informal, handwritten amendment to claims 1-4 is inappropriate for allowance. Appropriate correction is required.

Prosecution on the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

A shortened statutory period for reply to this action is set to expire **TWO MONTHS** from the mailing date of this letter.

***Allowable Subject Matter***

Claims 1-4 are allowable.

The following is a statement of reasons for the indication of allowable subject matter: The primary reason for allowance is the combination of a NO<sub>x</sub> trap assembly having an adsorption material which is regenerated with a mixture including hydrogen and carbon monoxide (syngas); a fuel cell power plant receiving air at an air inlet,

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receiving a hydrogen rich fuel mixture at a fuel inlet, and having humidified air exhausting from an air exit, means for generating syngas from said engine exhaust, the engine fuel and humidified air exhausting from said fuel cell power plant, in an amount in excess of that required to regenerate adsorption material in the NOx trap assembly; and a palladium membrane separator receiving at its input syngas, and provided at a main output thereof syngas for use in regenerating the adsorption material, and providing a hydrogen rich gas mixture to the fuel inlet of the fuel cell stack from an additional output of the separator. A combination of these and other limitations have not been found in the prior art.

### ***Conclusion***

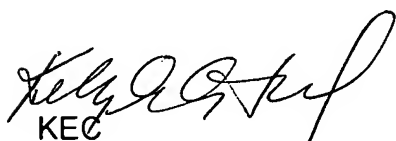
The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Wallman et al teaches a NOx reduction for engine exhaust. Boegner et al teaches an emission control system including a NOx absorber. Edlund et al teaches hydrogen-producing fuel processing system. Bailey et al teaches an exhaust trap assembly for a vehicle. Komatsu teaches a fuel reforming system. Sioui et al teaches a hydrogen generation system for reducing CO free stream to the fuel cell. Hershkowitz et al teaches a reformer for fuel cell systems. Paglieri et al teaches a hydrogen permeable membrane. Hall et al teaches a hydrogen production system for a fuel cell. Osaka et al teaches a catalyst for partial oxidation of hydrocarbons.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kelly E. Campbell whose telephone number is (571) 272-6693. The examiner can normally be reached on 9:00-5:30 Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chris Ellis can be reached on (571) 272-6914. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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